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## NEW SPECIES OF VOLUCELLINÆ FROM AMERICA (SYRPHIDÆ, DIPTERA)

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In 1926 (Ann. Ent. Soc. Amer., XIX, pp. 50–66), I presented a review of the American species of *Volucella* of which I had seen specimens. Since that time many other species have come to hand and I am now able to extend the scope of that paper and to present a key which, while still far from complete, includes more than thirty additional species. At the same time, I have removed from *Volucella* several species previously included in that genus, and believe the present arrangement will prove much more satisfactory.

### KEY TO GENERA

1. Face with three strong tubercles, one on either side of the median tubercle. *Ornidia* St. Fargeau and Serville.
   Face with only one tubercle....2.
2. Arista bushy plumose, appearing more or less strap-like....3.
   Arista loosely plumose or bare....4.
3. Hair of arista all of about the same length and extending to the tip. *Copestylum* Macquart.
   Arista with dorsal and ventral row of longer, isolated rays and with the apex broadly bare....*Volosyrpha* Shannon.
4. Arista pectinate, with long rays above and extremely short hairs below. *Volucellosia*, new genus.
   Arista plumose or bare, the ventral hairs never imperceptible....5.
5. Scutellum basally either with a very strong acute tubercle or with three weak tubercular swellings....6.
   Scutellum without tubercles basally....7.
6. Scutellum with three rather weak tubercular swellings which bear dense black pile; vertex of female strongly produced upward..*Apophysophora* Williston.
   Scutellum with a median, strongly produced, acute tubercle. *Viereckomyia* Curran.
7. Apical cross-vein strongly recurrent, strongly bowed outward in its middle...8.
   Apical cross-vein transverse or nearly so, at most slightly curved; spurious vein usually absent (Old World)....*Graptomyza* Wiedemann.
8. Eyes of male widely separated; front much longer than the face. *Megametopon* Giglio-Tos.
   Eyes of male contiguous; front shorter than the face or at most slightly longer. 9.
9. Pile of eyes dense and with scale-like hairs intermixed....*Lepidopsis* Curran.
   No scale-like hairs on the eyes....*Volucella* Geoffroy.

### MEGAMETOPON Giglio-Tos

GIGLIO-TOS, 1891, Boll. Mus. Zool. Anat. Comp., Torino, VI, No. 108, p. 5.
*Ophromyia* WILLISTON, 1891, 'Biol. Centr. Amer.,' Dipt., III, p. 55.

In both sexes the antennæ arise near the lower fourth of the eyes, making the front very long. The female in other respects very closely resembles species of *Volucella* Geoffroy but the male has the eyes dichoptic and is very easily recognized. Only one species, *nasicum* Williston, is known.

### ORNIDIA St. Fargeau and Serville

ST. FARGEAU AND SERVILLE, 1825, 'Encycl. Method.,' X, p. 786.

This genus was erected for a well-known and widely distributed species and differs from *Volucella* Geoffroy in the presence of strong tubercles on the sides of the face. The known species resemble each other closely and are brilliant green, bluish or cyaneous in color.

GENOTYPE.—*Syrphus obesus* Fabricius.

TABLE OF SPECIES

1. Face and front brownish red, not metallic.....*æmula* Williston.
   Face and front metallic green to violaceous.....2.
2. Femora reddish basally.....*obesoides* Giglio-Tos.
   Legs wholly black.....3.
3. With two or four prescutellar bristles; the slight scutellar depression is more or less divided in the middle.....*major*, n. sp.
   Without prescutellars; scutellar depression deepest in the middle.
   *obesa* Fabricius.

### **Ornidia major**, new species

Bright metallic green with blue or violaceous reflections; legs black; wings tinged with luteous, with a transverse brown spot near the middle in front and with a very small one at the apex of the marginal cell. Length, 13 mm.

MALE.—This species is so similar in general appearance to *obesa* Fabricius that a detailed description is unnecessary and a comparison of the two will best serve to differentiate them. *O. major* is larger, the lateral facial tubercle stronger and more oval in outline; third antennal segment much broader; two or four prescutellar bristles; scutellum more transverse apically and with two transverse, preapical depressions which are weakly separated from each other in the middle. The outer forceps of the male genitalia are triangular instead of finger-like and the genitalia are otherwise markedly different.

TYPES.—Holotype, male, "Brazil"; paratype, male, Los Paulo, Brazil.

In size this species is about the same as *æmula* Williston and I had it identified as that species, but in *æmula* the face and front are deep reddish and the spot at the apex of the marginal cell is very much larger than in any of the others.

### COPESTYLUM Macquart

MACQUART, 1846, 'Dipt. Exot.,' Suppl. I, p. 124.

Since the publication of my key to the species of *Copestylum* (Ent. News, XXXVIII, p. 43, 1927) another species has come to hand, and the description, drawn up by Dr. Irene Dobroscky, is published here for the first time. The key which follows will separate the known species.

TABLE OF SPECIES

1. Fourth abdominal segment clothed with abundant, erect pale pile, sometimes with coarse black hairs intermixed ..... 2.
   Fourth segment clothed with sparse, coarse, somewhat flattened, subappressed whitish hairs ..... *caudatum* Curran.
2. Wings at most a little darkened, with a blackish spot at the base of the stigma and along the anterior cross-vein ..... 4.
   Wings either with a large median brown cloud or brown in front of the third vein ..... 3.
3. Wings brown in front of third vein ..... *limbipennis* Williston.
   Wings with large, brownish median cloud ..... *salti*, n. sp.
4. Fourth abdominal segment without black hairs; border of scutellum broadly pale-haired ..... 5.
   Fourth segment with coarse black hairs intermixed with the pale pile; venter wholly black ..... *lentum* Williston.
5. Venter black with the narrow lateral border pale; legs black except the base of the tarsi ..... *simile* Giglio-Tos.
   Venter with second and third sternites yellowish, the second sometimes mostly black ..... *marginatum* Say.

### **Copestylum salti**, new species (Dobroscky)

Differs from other species by having a large, brownish, median cloud on the wings, which fades out posteriorly. Length, 10 mm.

MALE.—Face bleached yellowish, a rather broad median vitta, a broad brownish stripe separating the face and cheeks, the cheeks brown with a median and posterior stripe of yellow; the antennal tubercle very dark brown. Vertical triangle black, the posterior orbits narrowly grayish pollinose. Pile yellowish; black on the vertical triangle and forming a broad dense vertical black stripe on the eyes. Antennæ reddish brown, third segment tapering, arista very dark brown, densely short-haired except at base.

Thorax shining black, the lateral margins of the mesonotum, a pair of oval longitudinal prescutellar spots, and the scutellum yellowish. Pile wholly yellowish-white, fine. A large yellow spot on mesopleura above.

Legs mahogany brown; apices of femora and tibiæ, yellow; tarsi yellowish red, apical segment paler. Hair dark brown, ranging to golden brown at tarsi.

Wings hyaline, veins brown; a large brown median cloud. Squamæ and fringe white. Halteres yellow.

Abdomen shining yellow, first segment, median vitta and broad posterior border of second and third segment, and the fourth segment except the broad base, shining

black; sides of abdomen rather narrowly blackish, venter yellow, brownish along the middle line; pile pale yellowish, erect on fourth segment.

TYPES.—Holotype, male, paratype, male, Santa Marta, Colombia, July 17, 1927, (G. Salt).

### VOLOSYRPHA Shannon

SHANNON, 1929, Ann. Mus. Nac. Hist. Nat., Buenos Aires, XXXIV, p. 575 (a subgenus of *Volucella*).

In addition to the characters mentioned in the key this genus has, on either side of the scutellum, apically, a strong tubercular swelling which is clothed with abundant black hair.

The type of the genus is *Volucella tibialis* Macquart, which was originally described from a single male from Yungas, Brazil. Inasmuch as the third antennal segment was lacking no mention was made of the curious arista and this was not commented upon until 1888, when Williston redescribed the species, placing it in the new genus *Apophysophora*. This genus was distinguished from *Volucella* Geoffroy by the presence of two or three tubercular swellings on the scutellum, and obviously *hirtipes* was intended as the genotype. However, the second species in the genus differs rather markedly from *hirtipes* and lacks the unusual development of the arista. In *hirtipes* the arista is densely short-haired in addition to having long rays above and shorter ones below, while in *scutellata* the arista is of the ordinary plumose type and the scutellum is quite differently shaped. Prior to Williston's mention of *hirtipes*, Bigot had included it in his key to the species of *Phalacromyia*.

The most recent mention of the species is by Shannon in 1929. He evidently overlooked the generic diagnosis of *Apophysophora* Williston or he would not have concluded that his specimen represented an undescribed form. His subgenus, however, should stand as a good genus on the basis of the aristal development and scutellum and may be separated from *Apophysophora* Williston as indicated in the key.

The synonymy of the species is as follows.

#### Volosyrpha hiritipes Macquart

*Volucella hirtipes* MACQUART, 1849, 'Dipt. Exot.,' Suppl. IV, p. 130, (f.).

*Phalacromyia hirtipes* BIGOT, 1883, Ann. Soc. Ent. Fr., III, p. 81.

*Apophysophora hirtipes* WILLISTON, 1888, Trans. Amer. Ent. Soc., XV, p. 276.

*Volucella (Volosyrpha) tibialis* SHANNON, 1929, Ann. Mus. Nac. Hist. Nat., Buenos Aires, XXXIV, p. 575.

I have little doubt about the species described by Shannon being the same as Macquart's species. The color is somewhat variable. One judges from the description that Shannon's specimen was not in perfect

condition. Specimens in the Williston Collection agree very well with the description given by Macquart, Williston and Shannon. If the above synonymy should be wrong, a new name will be needed for the form described by Shannon, since Macquart, in 1846, described a *Volucella tibialis* from Mexico.

**APOPHYSOPHORA** Williston

WILLISTON, 1888, Trans. Amer. Ent. Soc., XV, p. 276.

The genus is very characteristic in the female sex, since the vertex is strongly produced upward, but in the male, the only character is the presence of the three tubercles near the base of the scutellum. These are not strong but are sufficiently developed to be readily seen.

The genotype is *Apophysophora scutellata* Williston.

Two species were originally included in this genus, no type being named. Inasmuch as Shannon has made *hirtipes* Macquart the type of *Volosyrpha*, the sole remaining species is *scutellata*. The type series of this species is before me.

**VIERECKOMYIA** Curran

CURRAN, 1925, Ann. Mag. Nat. Hist., XVI, p. 243.

Only the type species is known. The synonymy is as follows.

**Viereckomyia gibbera** Schiner

*Volucella gibbera* SCHINER, 1868, 'Novara Reise,' Dipt., p. 358.

*Volucella rospigliosii* BRETHES, 1920, Ann. Soc. Cient. Argentine, LXXXIX, p. 31.

CURRAN, 1925, Ann. Mag. Nat. Hist., XVI, p. 243.

A striking, large species, blue and violaceous in color, the wings broadly brownish in front.

**VOLUCELLOSIA,** new genus

Very similar to *Volucella* Geoffroy and resembling *V. satur* and allies in appearance, but at once distinguished by the long third antennal segment and pectinate arista.

GENOTYPE.—*Volucella fornax* Townsend.

The genus contains only the one species and is very easily recognized.

**LEPIDOPSIS** Curran

CURRAN, 1925, Ann. Mag. Nat. Hist., XVI, p. 247.

Characterized by the presence of scales among the pile of the eyes. The only known species is *compactus* Curran, described from Brazil.

**VOLUCELLA** Geoffroy

GEOFFROY, 1764, 'Hist. d'Ins. Env. de Paris,' II, p. 540.
*Cenogaster* DUMERILL, 1801, 'Zoologie Analitique,' p. 282.
*Pterocera* MEIGEN, 1803, Illig. Mag. f. Ins., II, p. 275.
*Temnocera* ST. FARGEAU AND SERVILLE, 1825, 'Encyc. Method.,' X, p. 786.
*Phalacromya* RONDANI, 1848, in Truqui, 'Studi. Ent.,' I, p. 67, (f.).
*Glaurotricha* THOMSON, 1869, 'Eugenes Resa,' Dipt., p. 493.
*Atemnocera* BIGOT, 1882, Bull. Soc. Ent. Fr., p. cxiv.
*Camerania* GIGLIO-TOS, 1892, Boll. Mus. Zool. Anat. Comp., Torino, VII, No. 117, p. 3.

The type of the genus is *Musca pellucens* Linné. I can find no character for the separation of *Phalacromya* Rondani unless we limit this genus to the species having a depression on the apical part of the scutellum. At first sight it appears that the genus, as here treated, contains a number of segregates which might well be given generic rank but, with the exception of the species falling into *Phalacromya*, the characters intergrade. It is possible that a more comprehensive study of the group will result in the discovery of characters sufficiently well marked to permit of the separation into more than one genus.

TABLE OF SPECIES

1. Scutellum with preapical depression ..... 2.
   Scutellum differently shaped, flattened to strongly convex ..... 21.
2. Face metallic green ..... 3.
   Face not metallic green ..... 4.
3. Eyes with dense, short, thickened white pile; cheeks with yellow triangle; tarsi reddish ..... *viridis* Williston.
   Eyes with normal cinereous pile; cheeks wholly green; tarsi blackish. *ernesta* Curran.
4. Bristles of the thorax yellow ..... 5.
   Bristles of the thorax black ..... 11.
5. Wings with sharply defined, triangular, apical brown spot ..... *tympanitis* Fabricius.
   Wings without sharply defined apical spot ..... 6.
6. Squamæ brown or with brown border ..... 7.
   Squamæ yellowish ..... *pallens* Wiedemann.
7. Mesonotum wholly pale pilose on posterior half ..... 8.
   Mesonotum broadly black pilose in front of scutellum ..... 10.
8. Disc of scutellum with coarse black hairs ..... *vaga* Wiedemann.
   Disc of scutellum with pale hairs only ..... 9.
9. Cheeks and face separated by a very broad brownish vitta ..... *chapadensis*, n. sp.
   No brown vitta separating face and cheeks ..... *brevifacies* Curran.
10. Broad sides of mesonotum yellow pilose on whole length ..... *brevivittata*, n. sp.
    Mesonotum black pilose on full width posteriorly ..... *musicana*, n. sp.
11. Scutellum without lateral flattened or depressed roughened areas ..... 12.
    Scutellum with lateral flattened or depressed roughened areas ..... 19.

12. Squamæ or at least the border and fringe brown or black ..... 13.
Squamæ and fringe yellowish or reddish ..... 107.
13. Face wholly black or with a median brown or black stripe ..... 14.
Face without a median dark vitta; legs brown, the basal segment of the posterior tarsi reddish; cheeks with a slender vitta; face produced strongly downward as a narrow cone; thorax rusty brown, the mesonotum violaceous on the disc; scutellum wholly black pilose ..... 105.
14. Legs wholly black ..... 15.
Coxæ yellow or the legs otherwise pale ..... 16.
15. Sides of face very broadly yellow ..... *vierecki* Curran.
Face black with a narrow whitish pollinose strip on either side below. *cinctiventris*, n. sp.
16. Thorax wholly pale, the dorsum black-haired; scutellum with large, roundish black spot covering most of its surface ..... *discalis* Curran.
Thorax largely dark or practically all pale-haired; scutellum differently colored ..... 17.
17. Scutellum with yellow base and apex; facial vitta broad and reaching the antennæ; front of female usually pale except above ..... 18.
Scutellum wholly violaceous; facial vitta narrow, not nearly reaching base of antennæ; front black ..... *fracta* Curran.
18. Pteropleura black-haired; mesonotum narrowly yellow behind the suture. *musana*, n. sp.
Pleura wholly yellow pilose; mesonotum very broadly yellow behind the suture. *mus* Williston.
19. Lateral depressions on scutellum as long as wide ..... *tricincta* Bigot.
Lateral depressions on scutellum decidedly transverse ..... 20.
20. Fourth abdominal segment entirely pale; ferruginous species with narrow black apices to the abdominal segments ..... *chalybescens* Wiedemann.
Fourth segment black or bordered with black ..... 106.
21. With a prescutellar row of bristles or at least a pair of short, spinous bristles .. 22.
Without clearly differentiated prescutellar bristles ..... 59.
22. Marginal cell much broadened before its tip and always closed ..... 23.
Marginal cell scarcely widened apically, sometimes open ..... 25.
23. Legs black ..... 24.
Legs reddish ..... *spinigera* Wiedemann.
24. Front yellow pilose; four setigerous tubercles on scutellum. *spinithorax* Arribalzaga.
Front black pilose; six setigerous tubercles on scutellum ..... *fulvicornis* Bigot.
25. Epistoma strongly projecting forward and acutely conical; face scarcely produced downward ..... 26.
Face, if produced forward also considerably produced downward ..... 29.
26. Third antennal segment kidney-shaped ..... 27.
Third antennal segment very slightly concave above ..... *pica* Schiner.
27. Third and fourth abdominal segments wholly black ..... *pubescens* Loew.
Third and fourth abdominal segments mostly reddish ..... 28.
28. Front of female less than three times as wide as ocellar triangle (Jamaica). *intona* Curran.
Front of female at least four times as wide as ocellar triangle ... *haagii* Jænnicke.

29. Face with dark median vitta or wholly dark.....30.
Middle of face wholly pale, at most the sides and cheeks blackish or brown..33.
30. Face and front steel-blue; body chalybeus or metallic greenish blue; wings with quadrate black spot in middle anteriorly.....*azurea* Philippi.
Face pale brown or with median blackish vitta.....31.
31. Mesonotum with a rectangular, yellow prescutellar spot; pleura with soft, whitish pile.....*isabellina* Williston.
Mesonotum with a geminate prescutellar yellow spot or not yellow posteriorly.....32.
32. Mesonotum with prescutellar geminate yellow spot; tibiæ reddish basally; second abdominal segment pale yellow.....*comastes* Williston.
Mesonotum greenish cyaneous; legs wholly black; second abdominal segment yellow with black apex and median vitta, the following segments usually with laterally widened, broad, basal reddish fascia.....*macquarti* Curran.
33. Wings without sharply defined brown spots, sometimes delicately infuscate anteriorly or along the veins.....34.
Wings with one or more sharply defined brown spots.....49.
34. Abdomen wholly metallic green; no dark anterior vitta on cheeks; legs reddish, the femora chiefly black above; squamæ thick, the fringe short, rusty reddish; wings hyaline with brown stigmal spot.....*barei* Curran.
Differently colored species.....35.
35. Abdomen deep violet, the base light yellow; wings infuscate; head broad, the face produced acutely downward.....*amethistina* Bigot.
Abdomen differently colored or otherwise different.....36.
36. Scutellum armed with six or eight strong, setigerous tubercles; large, blackish species with rusty brown scutellum; face reddish yellow, the oral margin narrowly black.....37.
Scutellum rarely with setigerous tubercles (if so the abdomen pale in color), although the bristles may arise from a slightly raised base.....38.
37. Cheeks black behind.....*scutellata* Macquart.
Cheeks wholly reddish or yellowish.....99.
38. Head very large, inflated; no distinct facial tubercle, the face carried straight downward into a narrow, acute cone; squamæ white with brown border and fringe; thorax with soft white pile and black hair intermixed.....39.
Head not unusually large; facial tubercle present.....40.
39. Basal three sternites wholly pale.....*escomelli* Curran.
Second and third sternites bearing large black triangles.....*concinna* Philippi.
40. Abdomen brownish black, shining; thorax cobalt-blue; legs castaneous; frontal triangle black pilose.....*chætophora* Williston.
Abdomen not wholly black, if so the frontal triangle pale pilose.....41.
41. Squamæ white, the outer half of the lower lobe yellowish and very much thickened.....*vesiculosa* Fabricius.
Squamæ differently colored and not thickened.....42.
42. Squamæ with yellow border and fringe.....43.
Squamæ with black border and fringe; abdomen black, the second and third segments usually largely yellow.....45.
43. Third and fourth abdominal segments with the basal third yellow pilose.....44.
Third and fourth abdominal segments black pilose.....*dorsalis* Wiedemann.

44. Scutellum yellow.....*prescutellaris* Williston.
Scutellum shining black.....*Megametopon nasicum* Williston.
45. Wings wholly hyaline.....*vitripennis* Curran.
Wings conspicuously infuscated, at least on the anterior part.....46.
46. Scutellum wholly yellow.....47.
Scutellum black or brown on apical third or more.....48.
47. Sides of facial tubercle and of the mesonotum behind the suture, yellow pilose. *persimilis* Williston.
Facial tubercle wholly black-haired; sides of mesonotum posteriorly with very little yellow pile.....*fuscipennis* Macquart.
48. Scutellum wholly blackish.....*panamensis*, n. sp.
Scutellum broadly reddish basally, at least in the middle.....*correcta* Curran.
49. Scutellum with twenty setigerous tubercles on the margin; abdomen rusty reddish.....*cockerelli* Curran.
Not more than eight setigerous tubercles; abdomen not wholly reddish.....50.
50. Pleura with soft, whitish pile.....51.
Pleura with coarse pile or hair.....52.
51. Costal border brown on apical half in front of third vein....*megacephala* Loew.
Costal border not brown on apical half.....*macrocephala* Giglio-Tos.
52. Abdomen entirely pale yellow; thorax rusty yellow.....*unicolor* Curran.
Abdomen not entirely yellow, at least fasciate with black.....53.
53. Scutellum with six or eight strong, setigerous tubercles (cf. couplet 37). *scutellata* Macquart.
Scutellum without strong tubercles.....54.
54. Legs wholly black.....55.
Legs partly pale-colored.....56.
55. Wings very strongly brownish apically, clouded along the veins..*alcedo* Curran.
Wings evenly very pale brownish apically in front, not clouded along the veins. *meretricias* Williston.
56. Abdomen yellow with very narrow black segmental apices; scutellum yellow above, flattened before its tips.....*opinator* Williston.
Abdomen differently colored.....57.
57. Squamæ whitish, the outer half of the lower lobe orange, much thickened; fringe pale.....*vesiculosa* Fabricius.
Squamal fringe blackish.....58.
58. Face very strongly produced downward; plumula brown..*cyanescens* Macquart.
Face moderately produced downward, rather obtuse; plumula pale yellowish. *macula* Wiedemann.
59. Thorax and abdomen with long, abundant pile, that on the thorax largely yellow.....100.
Thorax and abdomen with shorter, sparser pile, the ground color not concealed.....60.
60. Marginal cell broadened apically, always closed.....61.
Marginal cell scarcely broadened apically, often open.....80.
61. Margin of scutellum with very evident bristles.....62.
Bristles of scutellum scarcely differentiated from the hairs.....68.
62. Face with median black stripe.....63.
Face without median black stripe.....64.

63. Mesonotum thickly yellow pilose ..... *cæsariata* Williston.
Mesonotum thinly long black pilose ..... *fraudulenta* Williston.
64. Abdomen yellow with deep black posterior borders to the segments, first segment wholly black, the second with broad median vitta; mesonotum with rectangular prescutellar yellow spot ..... 65.
Abdomen black and reddish yellow, the colors differently arranged ..... 66.
65. Middle and sides of face black-haired ..... *tau* Bigot.
Face wholly yellow-haired ..... *satur* Osten Sacken.
66. Abdomen shining black or castaneous ..... 67.
Abdomen reddish yellow with blackish markings ..... *mellea* Jænnicke.
67. Wings hyaline; scutellum weakly tuberculate ..... *boliviana* Hine.
Wings with large median brown spot in front; scutellum with six strong tubercles. *fulvicornis* Bigot.
68. Face perpendicular, not tuberculate; marginal cell not bulbous at apex; wings clouded only on the cross-veins near the middle ..... 69.
Face concave above; wings with brown bands apically, the apex of the marginal cell bulbous ..... 74.
69. Mesopleura with a large, oval whitish spot behind ..... 70.
Mesopleura wholly blackish; arista twice as long as third antennal segment. *avida* Osten Sacken.
70. Wings with a large, quadrate brown spot near the middle anteriorly, brownish yellow on the basal half ..... *quadrata* Williston.
Only the median cross-veins clouded with brown ..... 71.
71. Face with a narrow brownish or blackish vitta ..... 72.
Face without median vitta ..... 73.
72. Abdomen with median black vitta ..... *lutzi*, n. sp.
Abdomen without median black vitta ..... *isabellina* Williston.
73. Fourth abdominal segment wholly black ..... *clarki*, n. sp.
Fourth abdominal segment yellow on basal half ..... *sternalis*, n. sp.
74. Mesopleura with a whitish yellow spot above ..... 75.
Mesopleura wholly blackish ..... 79.
75. Yellow spot on sternopleura, hypopleura, and metapleura ..... *fasciata* Macquart.
No pale spots on metapleura and sternopleura ..... 76.
76. Second abdominal segment wholly pale in front; posterior femora yellow on basal half ..... *picta* Wiedemann.
Second segment black with crescentric yellow spot ..... 77.
77. Legs reddish, the tarsi paler basally ..... 78.
Legs black, the basal two tarsal segments yellow ..... *pusilla* Macquart.
78. Scutellum yellow pilose ..... *imitans* Curran.
Scutellum with dense black pile on apical half ..... *timberlakei* Curran.
79. Scutellum thickly reddish yellow pilose ..... 98.
Scutellum chiefly black pilose ..... *unipunctata* Curran.
80. Abdomen unicolorous or practically so ..... 81.
Abdomen with the base broadly yellow or banded with reddish yellow ..... 92.
81. Abdomen not metallic green ..... 82.
Abdomen metallic green; small species ..... *barei* Curran.
82. Abdomen violaceous ..... 83.
Abdomen not strongly violaceous ..... 88.

83. Face pale yellow; cheeks black; front yellow pilose.....84.
Face rusty red to black; wings blackish on basal half in front or brownish on apical half or more.....85.
84. Scutellum pale yellow; only the veins near the middle of the wing clouded with luteous.....*abdominalis* Wiedemann.
Scutellum rusty reddish or brownish; wings luteous between the base and the rectangular median brownish cloud.....*eugenia* Williston.
85. Wings hyaline on apical half, blackish on basal half in front; face with a low, large tubercle; marginal cell closed.....*mexicana* Macquart.
Wings wholly more or less brown; face produced forward below.....86.
86. Antennæ bright red; marginal cell open.....*nigripes* Bigot.
Antennæ black or brown.....87.
87. Marginal cell open.....*tatei*, n. sp.
Marginal cell petiolate.....*duida*, n. sp.
88. Basal half of wings blackish or dark brown on the anterior half; large, broad species.....*esuriens* Fabricius.
Wings variable in color, but not as above.....89.
89. Wings wholly hyaline, the base but little brownish; cross-veins never darkened. *comstocki* Williston.
Cross-veins clouded or the wings extensively pale brownish.....90.
90. Wings wholly brownish.....*duida*, n. sp.
Wings not wholly brownish.....91.
91. Abdomen castaneous with slight purplish reflections; cross-veins clouded. *postica* Say.
Abdomen deep black; only the anterior cross-vein clouded; subcostal cell and base of wing brownish.....*anna* Williston.
92. Wings with small brownish spots on apex of marginal cell and on apical cross-veins.....*satur* Osten Sacken.
Wings either clouded apically in front or hyaline beyond the stigma.....93.
93. Epistoma produced as a long, porrect snout.....*pica* Schiner.
Epistoma not snout-like.....94.
94. Face with pale brown or blackish median vitta.....95.
Face wholly yellow.....*yura*, n. sp.
95. Basal abdominal segment black; each segment with a broad, more or less interrupted posterior black fascia.....*isabellina* Williston.
First abdominal segment, basal half of second and transverse spots on third and fourth segments yellowish or reddish.....96.
96. Tibiæ reddish.....97.
Tibiæ black.....*lugens* Wiedemann.
97. Front of female yellow; pile on basal half of femora mostly yellowish. *vagoides* Curran.
Front of female blackish; hair of legs all black.....*correcta* Curran.
98. Mesonotum wholly reddish yellow pilose.....*ornata* Williston.
Mesonotum largely black pilose.....*pulchripes* Bigot.
99. Face wholly black-haired.....*bradleyi* Curran.
Face yellow-haired on either side of lowest third.....*aricia*, n. sp.
100. Face yellow in ground color.....101.
Face brown or black.....103.

101. Third abdominal segment with a pair of large, sometimes confluent, reddish spots ..... *bombylans rufomaculata* Jones.
Third segment black in ground color ..... 102.
102. Thorax in part, at least the scutellum yellow pilose .. *bombylans plumata* De Geer.
Thorax and scutellum wholly black pilose (Europe) ..... *bombylans* Linné.
103. Antennæ reddish ..... 104.
Antennæ dark brown ..... *bombylans arctica* Johnson.
104. Abdomen wholly black pilose beyond the second segment. *bombylans americana* Johnson.
Fourth segment with tawny pilose band ..... *bombylans evecta* Walker.
105. Eyes black pilose ..... *johnsoni* Curran.
Eyes white pilose ..... *salti*, n. sp.
106. Fourth abdominal segment wholly white pilose ..... *deceptor* Curran.
Fourth abdominal segment white pilose only on the broad sides and extreme apex. *salti*, n. sp.
107. Mesonotum wholly pale ..... *punctifera* Bigot.
Mesonotum broadly black in front and in the middle ..... *corumbensis*, n. sp.

**Volucella salti,** new species

Related to *deceptor* Curran and *johnsoni* Curran. Differs from *johnsoni* in having the eyes white pilose and from *deceptor* in the absence of lateral scutellar depressions in the male and much more extensive black pile in both sexes. Length, 7 to 8 mm.

Male.—Face translucent brownish yellow, a narrow vitta separating the face and cheeks and the cheeks posteriorly, reddish brown; frontal triangle brown; occiput black, densely gray pollinose; vertical triangle small, black. Pile of head pale yellowish, sparse. Face produced downward and forward, rather acute, the upper part deeply concave and whitish pollinose above, the tubercle prominent. Antennæ reddish; third segment excised above beyond the middle; arista with black rays and apex.

Thorax reddish brown, the dorsum appearing violaceous or cyaneous, under magnification with four darker vittæ, the scutellar depression brown. Pile black or brown, in the vicinity of the humeri, yellow. Middle of scutellum sometimes reddish brown. Bristles black, rather weak on the scutellum.

Legs black, black-haired; apices of femora and basal segment of posterior four tarsi reddish; pile black.

Wings tinged with yellow, especially apically and in front; stigmal spot small, brown. Squamæ brownish; halteres reddish yellow.

Abdomen blackish, the base broadly and irregular, variable fasciæ on the third and fourth segments, brownish red. Pile black; whitish on the basal two segments except toward either side of the second posteriorly.

Female.—Front rather wide, shining black, with sparse white hair, the hair on the upper part and the occipital cilia black. Mesonotum usually more extensively brownish red. Abdomen shining black, the second segment usually with a pair of brownish-red spots on the basal half, the reddish fasciæ on the apical segments rarely indicated. Second segment black pilose on whole width posteriorly, the sides and apex of the fourth and the whole of the fifth, white pilose.

Types.—Three males and seven females, Rio Frio, Magdalena, Colombia, July 18, 20, 25, 26 and 27, 1927, (G. Salt). The holotype, male, and allotype, female, were taken on July 27 and 25, respectively.

This species is unusual in that the female possesses transverse lateral depressions on the scutellum while the male lacks them.

**Volucella chalybescens** Wiedemann

WIEDEMANN, 1830, 'Ausser. Zweifl.,' II, p. 204.

Dr. Salt collected a single male of this species at Rio Frio, Magdalena, Colombia, on July 12, 1927.

**Volucella deceptor** Curran

Figure 1

*Volucella fuscipennis* WILLISTON, 1888, Trans. Amer. Ent. Soc., XV, p. 276, (not Macquart).

*Phalacromyia deceptor* CURRAN, 1925, Ann. Mag. Nat. Hist., XVI, p. 248.

Williston mentioned two male specimens from Chapada, Brazil, but the collection contains a male and female, the former badly damaged. The species is very similar to *salti*, n. sp., but paler and the male has lateral depressions on the scutellum. The true *fuscipennis* Macquart is related to *persimilis* Williston and closely resembles it superficially.

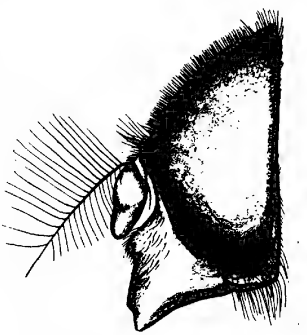

Fig. 1. *Volucella deceptor* Curran. Profile of head of male.

**Volucella tricincta** Bigot

BIGOT, 1875, Ann. Soc. Ent. France, V, p. 477.

*Volucella purpurifera* BIGOT, 1875, Ann. Soc. Ent. France, V, p. 477.

*Volucella varians* BIGOT, 1875, Ann. Soc. Ent. France, V, p. 781.

*Volucella fuscipennis* WILLISTON, 1891, 'Biol. Centr. Amer.,' Dipt., III, p. 54, (not Macquart).

This species is rather variable in color and a series of thirty specimens taken at Brownsville, Texas, January 2–13, 1928, by H. F. Schwarz, is much duller than any others examined. As a rule, the specimens are rather polished. However, the large lateral depressions on the scutellum render the species easily identifiable.

*Volucella fuscipennis* Macquart has not, so far as I know, been taken in North America and the name should be dropped from the record.

**Volucella chapadensis**, new species

Related to *vaga* Wiedemann but distinguished by the wholly yellow pilose scutellum, wider front in the female and somewhat shorter face. Length, about 9 mm.

FEMALE.—Head shining reddish-yellow, a very broad stripe separating the face and cheeks, an incomplete stripe on the middle of the cheeks and the occiput, black; a broad band of whitish pollen below the antennæ; occiput densely cinereous pollinose. Front blackish behind the ocelli, gradually widening from vertex to anterior margin. Pile pale yellowish, sparse on face and front, black only behind the ocelli. Face deeply concave above, the large tubercle as prominent as the antennal base. Antennæ yellowish, the arista with long black rays and apex, the third segment tapering from near the base.

Thorax reddish yellow, the median third or more of the mesonotum, a spot above the posterior coxæ and the scutellar depression black. Pile and bristles pale yellowish, the scutellar depression with inconspicuous black pile.

Coxæ and femora reddish yellow and yellow pilose, the apices of the femora more or less distinctly brownish; tibiæ and tarsi black in ground color, black-haired, the base of the tarsi somewhat reddish.

Wings cinereous hyaline, the apical third tinged with brown; a black spot at base of stigma. Squamæ brown; halteres yellow.

Abdomen rusty reddish-yellow or greenish yellow, the apices of the second and following segments broadly black, the base of the third segment narrowly black except laterally, the black fasciæ on the second and third segments not reaching the lateral margins. Pile short, black, yellow in front of the first black band, on the lateral margins and on the broad base of the fourth segment. Fifth segment wholly black. Venter wholly yellow.

MALE.—Frontal triangle small, yellowish, yellow pilose. Pile of thorax erect, not appearing silky from anterior view; abdomen black pilose beyond the apical fourth of the second segment.

TYPES.—Holotype, female, and allotype, male, Chapada, Brazil, (Williston Collection). The lower edge of the mouth of the male has been eaten by pests, but otherwise the specimen is in excellent condition.

This species looks very much like *vaga* Wiedemann but the thorax lacks the silky appearance when seen from in front and it is a smaller species. It differs from *brevifacies* Curran in having the face more produced downward and in having a broad brown stripe separating the face and cheeks.

**Volucella vaga** Wiedemann

WIEDEMANN, 1830, 'Ausser. Zweifl.,' II, p. 205.
*Volucella musta* WILLISTON, 1888, Trans. Amer. Ent. Soc., XV, p. 274.

Since the publication of my notes on the type of *vaga* I have examined the type series of *musta* Williston and find that the specimens, all males, agree with the specimen compared with the type of *vaga*. The species I had determined as *musta* I now describe as *musicana*, n. sp.

**Volucella brevivittata,** new species

Related to *vaga* Wiedemann but the mesonotum is black pilose on the median third, the median black mesonotal vitta is much narrower and does not reach the scutellum, etc. Length, 9 mm.

MALE.—Face and frontal triangle yellow, anterior oral margin, a broad stripe separating the face and cheeks and a narrow stripe on the middle of the cheeks, brown. Occiput black, densely gray pollinose; vertical triangle black, black pilose, the pile of the head yellowish, short and tawny on the eyes. Face deeply concave above, more prominent below than the antennal base, with a strong tubercle, produced moderately downward. Antennæ reddish yellow; rays and apex of the arista brown.

Thorax yellow, vitta occupying the median fourth of the mesonotum, a spot on the sternopleura and another above the posterior coxæ, shining black, the mesonotal vitta not reaching the scutellum; scutellar depression brown. Pile and bristles bright yellow, black on the median third or more of the mesonotum and on the scutellum.

Coxæ and femora yellow; broad apices of the femora brown; tibiæ and tarsi black.

Wings hyaline, with slight yellowish tinge, the apical fourth somewhat gray; stigmal spot small, blackish. Squamæ brown; knob of halteres white.

Abdomen rusty reddish, the base broadly reddish yellow; apex of the second and following segments broadly black, the third and fourth with the lateral margins black and with a median vitta which broadens and is divided in front, that on the third segment obsolete posteriorly. Pile short, black, yellow in front of the black fascia on the second segment and on the venter.

HOLOTYPE.—Male, Chapada, Brazil, (Williston Collection).

### **Volucella musicana**, new species

*Volucella punctifera?* WILLISTON, 1888, Trans. Amer. Ent. Soc., XV, p. 275.

Related to *vaga* Wiedemann but at once distinguished by having about the posterior third of the mesonotum black-haired, absence of silky sheen and by the absence of black on the mesonotum. Length, 8 to 9 mm.

MALE.—Face and frontal triangle yellowish, a broad stripe separating the face and cheeks and another below the eyes, brown; cheeks reddish, occiput black in ground color, thickly cinereous pollinose; vertical triangle black, black pilose, the pile elsewhere yellowish. Upper half of face deeply concave, whitish pollinose above, the lower half as prominent as the antennal base and with a large, low tubercle, the face produced moderately downward. Antennæ dull orange, the third segment gently tapering from base to apex; arista with brown rays and apex.

Thorax yellow, the mesonotum, except the broad sides rusty reddish, yellow pilose, the posterior third of the mesonotum and the scutellum with black pile, the ventral fringe yellow; scutellar depression black.

Coxæ and femora reddish; tibiæ and tarsi black, the basal tarsal segment reddish.

Wings cinereous hyaline, the apical third gray; stigmal spot black. Squamæ brown; halteres yellow.

Abdomen rusty reddish, the basal two segments reddish yellow; broad apex of second segment, base and broad posterior border of the third and fourth, black, these latter sometimes almost all shining blackish or black with incomplete reddish fasciæ which may be interrupted; black fascia on second segment never reaching the lateral margin. Pile black, yellow on base of abdomen, lateral margins, broad apex of the fourth segment and venter. Genitalia ferruginous.

FEMALE.—Front reddish, moderately wide, gently narrowing to the vertex; pile short, brown. Third and fourth abdominal segments black with a broad, anteriorly concave yellowish fascia; fifth segment black.

TYPES.—Holotype, male, allotype, female, and two paratypes of each sex from Chapada, Brazil, (Williston Collection).

Williston doubted his identification of *punctifera* Bigot and I do not think this could possibly be that species. I have a specimen agreeing quite well with Bigot's description but until the type has been examined the identity of the species must remain in doubt.

**Volucella cinctiventris,** new species

Related to *vierecki* Curran but the face is black in ground color, with a narrow, tapering reddish vitta on either side of the lower half. Length, 8.5 mm.

FEMALE.—Face shining black, the upper third and a reddish vitta on either side of the lower half, whitish pollinose; lateral oral margin and a stripe on the front of the cheeks, reddish. Face deeply concave above, the lower part level with the base of the antennæ, produced downward, the tubercle low and broad; pile yellowish. Front bluish black, with a conspicuous concavity on the lower third, the sides practically parallel on the upper half; pile pale yellowish, on the lateral depressions abundant and appressed, appearing silvery; the vertex black-haired, the black hairs extending along the middle line to well in front of the ocelli. Occiput densely yellowish pollinose and with yellow pile; no black occipital cilia. Antennæ regular in outline, brownish red, the third segment mostly reddish brown; arista black on apical half, the long rays black.

Thorax metallic greenish black, the mesonotum opalescent; pile short, pale yellowish; humeri yellow. Scutellum reddish yellow, with slight opalescence dorsally, the pile short, appressed, black, the margin with three pairs of black bristles; before the apex a moderately deep, transverse depression; no prescutellar bristles.

Legs blackish, black-haired; tarsi brown; coxæ pale-haired anteriorly.

Wings clouded with pale brown on apical half, with luteous tinge basally; marginal cell open. Squamæ white, with brown border and fringe. Halteres whitish.

Abdomen opalescent green with very strong violaceous reflections, the first segment and basal half of the second laterally, reddish yellow. Pile short, erect, pale cinereous yellowish, the second and following segments toward the sides with some black hair posteriorly.

HOLOTYPE.—Female, Barro Colorado Island, Canal Zone, January 8, 1929, (Curran).

**Volucella musana,** new species

Related to *mus* Williston but the mesonotum is only narrowly yellow behind the suture and the pteropleura is black-haired. Length, 8 mm.

FEMALE.—Face and cheeks pale orange, brown as follows: a broad median vitta reaching to the base of the antennæ, broad ones separating the face and cheeks and the posterior part of the cheeks; pile yellow, rather sparse. Front pale orange, with an anteriorly broadened median brown vitta on the lower three-fifths, the upper two-fifths shining brownish-black; pile black, yellow on lowest fifth; lateral depressions

wide; transverse depression wide and shallow; front widening from vertex to anterior margin. Face rather strongly produced downward, receding from the tip of the low tubercle to the anterior oral margin, concave on more than the upper half, the upper part of the concavity thinly whitish pollinose. Occiput black, thickly cinereous pollinose, pale yellowish pilose, the occipital cilia black. Antennæ orange, regular in outline, the arista brown, with long black rays.

Mesonotum black, overcast with metallic green and with more or less opalescent reflection; broad lateral border in front of the suture, narrow lateral border behind the suture and the posterior border, yellow. Pleura blackish brown, thinly yellowish-brown pollinose; a large rectangular spot beneath the humeri and the posterior half of the mesopleura, yellow; area above the front coxæ and a broad band extending from the squamæ to the middle coxæ, reddish. Scutellum blackish, the narrow base and broad apex reddish yellow, the transverse depression yellow. Scutellar pile brownish, the three pairs of marginal bristles black.

Legs black, the coxæ and femora reddish; pile black, yellow on the coxæ and on basal half of the femora posteriorly.

Wings brownish on apical half, tinged with luteous on basal half. Squamæ yellowish, with brown border and fringe. Knob of halteres white, the stem reddish.

Abdomen shining black, the first segment and basal half of the second yellow; third and fourth segments with a basal transverse reddish spot toward either side. Pile black on the apical half of the second and third segments and almost the whole of the fourth, elsewhere pale yellowish and wholly pale on the lateral margins.

HOLOTYPE.—Female, Barro Colorado Island, Canal Zone, January 7, 1929, (Curran).

### **Volucella panamensis,** new species

Related to *correcta* Curran but the scutellum is wholly dark in ground color. Brown, with greenish opalescence on the mesonotum and scutellum. Length, 8 to 10 mm.

MALE.—Face and cheeks reddish, the former with a broad, obscure blackish vitta on the lower half, the oral angles blackish; a broad band of yellow pollen below the antennæ. Face strongly concave above, below the broad, nose-shaped tubercle a little more prominent than the antennal base, moderately produced downward; pile black. Frontal triangle small, shining black, the upper angle brownish yellow pollinose; at most a few black hairs laterally. Occiput black, cinereous pollinose and yellowish pilose; occipital cilia and hair of the small, black vertical triangle, black. Antennæ brownish red, regular in outline; arista with black rays, the base broadly reddish.

Mesonotum broadly brownish-red laterally, the disc greenish black with strong opalescent reflections, in front of the suture with brownish-gray pollen. Pleura shining reddish and ferruginous. Scutellum with the free border shining brown, the disc dull metallic greenish. Pile wholly black; a row of prescutellar bristles; scutellum with four pairs of marginals.

Legs black; femora reddish, the base and lower surface more or less black. Hair wholly black. Coxæ reddish.

Wings brownish, paler posteriorly, the basal half more luteous or grayish; apical cell petiolate. Squamæ brown, with black border and fringe. Halteres reddish, the knob sulphur-yellow.

Abdomen brown, the first segment and more than the basal half of the second, reddish, the third and fourth on either side each with a large, subtriangular basal reddish spot. Genitalia small, reddish. Pile black except on the first segment and basal two sternites.

FEMALE.—Front shining black, black pilose, the sides gently diverging on the lower three-fourths; in the middle with a shallow, longitudinal groove, the lateral depressions fairly well marked; ocellar triangle near the vertex. Base of abdomen yellow instead of reddish.

TYPES.—Holotype, male, Barro Colorado Island, Canal Zone, February 13, 1929; allotype, female, same locality, January 28, 1929, (Curran).

### **Volucella corumbensis,** new species

Related to *viridis* Williston but without green coloration; ferruginous reddish with black markings. Length, 7 mm.

MALE.—Head reddish, an incomplete stripe separating the face and cheeks and the posterior third of the cheeks, brown; occiput black, densely gray pollinose; front greenish black, almost the upper third, the raised median vitta and the region above the antennæ reddish. Front wide, the lateral depressions wide but not deep, the pile fairly abundant. Face moderately concave on upper half, the tubercle prominent, the lower section of the face as prominent as the antennal base and vertical, the face produced moderately downward. Pile pale yellowish, on the eyes reddish yellow. Antennæ reddish yellow, the long rays and apex of the arista black.

Thorax ferruginous red, in front of the suture and the median third on the anterior two-thirds of the mesonotum, black, the black vitta divided posteriorly; notopleura ferruginous; humeri yellow. Pile pale brassy yellow; bristles black. Scutellar depression well before the apex.

Legs ferruginous, the femora with yellowish apices and generally more reddish; basal segment of the tarsi yellowish. Pile black, long on the tibiæ, yellowish on basal part of the femora.

Wings cinereous hyaline, a little darker apically; stigmal spot small, black. Squamæ and their fringe yellowish. Knob of halteres white.

Abdomen ferruginous red, the base broadly darker, the dark coloration on the second segment divided by a narrow median vitta. Pile short but conspicuous, pale brassy yellow. The abdomen is oval and strongly convex.

HOLOTYPE.—Female, Corumba, Brazil, April, (Williston Collection).

### **Volucella lutzi,** new species

Related to *isabellina* Williston but the thorax is much less pollinose, the abdomen bears a median black vitta and the front of the female is broadly pale yellow pilose on the lower half laterally. Differs from *avida* Osten Sacken in having a large pale yellowish spot on the mesopleura. Length, 12 to 12.5 mm.

MALE.—Face and front pale yellowish, shining; a narrow median brown vitta extends from the oral margin to the upper fourth of the face and the frontal lunule is brown. Pile of front and middle of face black; on the sides and lower fourth of face, cheeks and occiput, pale yellowish. Cheeks shining brown; occiput brown, densely cinereous white pollinose; vertical triangle brownish red, black pilose. Eyes brown pilose, posteriorly and ventrally with pale yellow pile. Frontal triangle gently con-

vex, prominent; face almost perpendicular, with only slight trace of tubercle, sharply conical below. Antennæ short, brownish; rays of arista black.

Mesonotum shining black, on the anterior half with a pair of broad, pale yellowish pollinose vittæ which are slightly divergent posteriorly; lateral margins broadly and a transverse, rectangular prescutellar spot, pale yellowish. Pleura reddish brown, the mesopleura pale yellowish posteriorly. Pile pale yellowish, crinkly, on the mesonotum and pteropleura with coarser black hairs intermixed. Scutellum translucent reddish yellow, black-haired, the base very narrowly pale-haired. Bristles of thorax hair-like.

Legs brown; tibiæ reddish yellow on about the basal half; hair black.

Wings hyaline; cross-veins at middle of wing narrowly clouded with brown, the costal cell apically and the stigmal cell tinged with luteous; stigmal spot brown. Squamæ white, fringe yellow. Halteres reddish yellow with brown knob.

Abdomen reddish yellow with shining black fasciæ and median vitta. First segment black; second with the base, except laterally, the posterior fifth and a medianly narrowed median vitta, black; third segment with posterior fifth and anteriorly tapering median vitta black. Fourth segment with a broad black fascia on the posterior half which emits a narrow median vitta toward the base of the segment, the anterior half of the segment pale orange. Pile whitish yellow, black on the posterior half of the second and third segments. First sternite brown except the apex; second with a broad basal fascia and the median fifth, brown; third with the posterior border, widening medianly and laterally, blackish. Fourth sternite blackish with a pair of large, narrowly separated basal yellow triangles. Genitalia shining blackish.

FEMALE.—Front wide, pale yellow, reddish yellow above, the ocellar triangle brown; pile black, pale yellowish on the lateral third of more than the lower half; frontal depressions very wide. Black fasciæ on second and third abdominal segments wider than in male; fifth segment black with a reddish triangle extending the whole length in the middle; second sternite wholly pale.

TYPES.—Holotype, male, and allotype, female, Coyote Mountains, Arizona, August 4–7, 1916, altitude about 3,500 ft., (F. E. Lutz); paratype, female, "California," (Wheeler Collection).

### **Volucella clarki,** new species

Related to *isabellina* Williston but without a brown facial vitta and with the apical abdominal segment entirely black. Length, 15 to 17 mm.

MALE.—Head yellow; cheeks and face separated by a brown stripe; occiput black, yellow pollinose; vertical triangle reddish yellow, the ocellar triangle black. Pile of head yellow, the vertical triangle black-haired, the frontal triangle with a few scattered black hairs. Frontal triangle broad, gently convex; face receding on lower fourth, perpendicular above, not tuberculate. Antennæ reddish brown; third segment narrowed on apical half; arista with black rays.

Mesonotum shining black, the anterior two-fifths thinly pale pollinose, in the middle with a pair of broad cinereous vittæ extending from the anterior margin almost to the middle; lateral margins broadly and a broad, subrectangular prescutellar spot, pale yellowish. Pleura reddish brown, the mesopleura mostly and the upper edge of the sternopleura pale yellow. Pile whitish yellow, dense laterally, intermixed with

black on the mesonotum. Scutellum translucent reddish yellow, with short, appressed black hair, the margins with longer yellowish pile; no bristles.

Legs blackish, the tibiæ and tarsi brown; basal half or less of the tibiæ and the apices of the femora reddish; hair black.

Wings hyaline; tinged with brown basally, the cross-veins bordered with brown, the stigmal cell brown. Squamæ yellow, with reddish yellow fringe. Halteres reddish brown.

Abdomen yellow and black. First segment black except laterally. Second segment with the posterior fifth and a slender median vitta black. Third segment black on the posterior half laterally, the pale base narrowed in the middle by the triangular projection of the black band. Fourth segment wholly black. First segment wholly and basal two-thirds of second pale yellowish pilose; third segment black pilose with the basal sixth, widening to one-half at the sides, yellow; fourth segment with short black pile and long pale hairs intermixed, the base wholly pale pilose. Sternites black posteriorly, yellow anteriorly, the black covering most of the fourth sternite and leaving anterior, medianly interrupted pale, triangles, the pale areas increasing in extent on each of the preceding sternites, the first wholly black except its apex.

FEMALE.—Front wide, black pilose, the broad lateral depressions with yellow pile; a brownish spot connects the black ocellar triangle and the frontal orbits. Fourth abdominal segment with less pale pile but with more conspicuous pale pile in front toward the sides; fifth segment wholly black and black-haired. Venter similar to male.

TYPES.—Holotype, male, San Xavier, near Tucson, Arizona, July 24, 1916, (F. E. Lutz); allotype, female, San José del Cabo, (Wheeler Collection).

In many respects this species resembles *quadrata* Williston but it differs in having more sharply defined black markings on the abdomen, no pale pile on fifth abdominal segment of female and in having the black band on the second sternite narrowest laterally.

It is with pleasure that I name this fine species in honor of Mr. B. Preston Clark, under whose auspices the 1916 expedition to Arizona was undertaken.

**Volucella sternalis,** new species

Related to *isabellina* Williston but without a median brown facial vitta. Length, 12.5 mm.

MALE.—Face and front translucent waxy yellow, the frontal triangle broad and strongly convex, black pilose; face black pilose in the middle on the upper half, gently concave on upper fourth, receding on lower fifth; cheeks reddish yellow with broad brown stripe in front. Occiput black, thickly cinereous yellow pollinose, with short, pale yellowish pile. Vertical triangle small, black and black pilose. Eyes with reddish yellow hair. Antennæ reddish, the third segment narrow on apical third; arista with black rays.

Mesonotum shining black, on the anterior half with a pair of broad, grayish pollinose vittæ, the sides broadly and a transverse prescutellar spot, waxy yellow. Pleura brown, the mesopleura mostly yellow. Pile pale yellow, the mesonotum with

a broad band of black hair behind the suture. Scutellum translucent waxy yellow, with short, subappressed black hair, the base narrowly yellow pilose.

Legs brown; broad apices of femora and basal half or more of the tibiæ reddish yellow; hair black.

Wings hyaline; cross-veins at middle of wing bordered with brown, the base of the wing brownish along the veins; stigmal cell luteous. Squamæ yellowish, with brown fringe. Halteres brownish, the apex of the knob yellow.

Abdomen yellowish, with brown fasciæ. First segment brown except the sides. Second segment with the posterior border brown, interrupted in the middle and with an anteriorly widened median vitta. Third segment with the posterior fourth produced forward as narrow triangles in the middle and at either side, brown. Fourth segment with a broad, arched brown fascia across the posterior third. Genitalia reddish brown. Pile short, yellow and black; on the second segment the black pile occupies more than the posterior half laterally, and narrows to occupy only the posterior third medianly; third segment with the basal fourth, widening to half at the sides, yellow pilose; fourth segment yellow pilose except on the brown fascia. Second, third and fourth sternites each with a large brown triangle; first sternite mostly brown.

HOLOTYPE.—Male, San José del Cabo, (Wheeler Collection).

### **Volucella tatei**, new species

Black with violaceous and greenish opalescent reflections; oral margin produced strongly forward and downward. Length, 11.5 mm.

FEMALE.—Head black, the face produced below to form a conical snout; sides of face very broadly, a band below the antennæ, occiput and frontal orbits on lower half, cinereous white pollinose. Face and occiput with whitish hair, the latter with some short black hairs toward the vertex. Front shining black, black pilose. Basal two antennal segments black, the third brown, paler basally on under surface; arista reddish basally, with long black rays. Pile of eyes with tawny tinge, becoming brownish above.

Thorax pale pilose, with black hairs intermixed dorsally, the scutellum wholly black-haired and with four pairs of marginal bristles. Mesonotum and scutellum, with the exception of the margins, greenish opalescent. Pleura thinly brown pollinose.

Legs black, black-haired. Wings brown, becoming paler posteriorly; marginal cell open. Squamæ brown. Halteres yellow with white knob.

Abdomen blackish, very strongly violaceous; short cinereous pilose, the apices of the segments black pilose except laterally.

TYPES.—Holotype, female, Mt. Duida, Venezuela, January 16, 1929, (G. H. H. Tate); paratype, another female from the same locality, December 1, 1928.

### **Volucella duida**, new species

Related to *tatei*, new species, but the face is much less produced and bears a long, yellowish triangle on either side. Length, about 11 mm.

FEMALE.—Head black, the face with a yellowish triangle reaching from the orbit to the oral margin, the sides broadly cinereous-white pollinose; orbits densely cinereous pollinose, white pilose, toward the vertex bare and with short black pile.

Front shining black, whitish pollinose along the orbits on the lower half, the pile black. Face below more prominent than the antennal base, produced downward and with a conspicuous tubercle. Antennæ brown; arista reddish on basal third, with black rays of moderate length. Eyes with reddish-brown pile which becomes tawny below.

Thorax black, cinereous-yellow pilose, the pleura, with the exception of the mesopleura, and the scutellum wholly, black-haired; mesonotum with black hairs scattered among the pale pile, especially posteriorly. Scutellum with three pairs of black marginal bristles; no prescutellar row. Mesonotum and scutellum greenish opalescent or violaceous, the margins dull.

Legs black, black-haired. Wings brown, becoming paler behind; marginal cell petiolate, not widened apically. Squamæ brownish. Halteres whitish on apical half, reddish basally.

Abdomen black, more or less bronzed or violaceous; pile short, whitish and black; lateral margins and first segment wholly, basal half of second, a broadly interrupted fascia on the third and the fourth segment except basally, pale pilose.

TYPES.—Six female specimens from Mt. Duida, Venezuela, December 10, 1928, January 11 and 16, 1929, (G. H. H. Tate). The holotype was taken on January 16.

### **Volucella yura,** new species

A peculiar small species, evidently related to the *avida* group, but with a short head and the face unusually produced downward, the abdomen shining metallic-black with opaque fasciæ and reddish spots on the second segment. Length, 9 mm.

FEMALE.—Face shining yellowish, separated from the cheeks by a black vitta, the cheeks black on more than the posterior half; pile soft and whitish; face perpendicular, with a small tubercle below the middle, more than half the face below the lower level of the eyes. Occiput black, gray pollinose behind the eyes, wholly cinereous-white pilose. Front shining metallic-black; the lower sixth concolorous with the face; pile black, the depressions thickly covered with cinereous white pubescent-like pile, thickly punctured and much wider than the median part.

Thorax shining black, cinereous-white pilose, on the mesonotum with longer black hairs intermixed. Scutellum ferruginous, the border blackish. Thorax without bristles.

Legs black; apices of femora and basal two-thirds of the tibiæ reddish; pile black, cinereous white on the femora posteriorly.

Wings hyaline; anterior cross-vein bordered with brown; base of stigma brown. Squamæ whitish yellow; halteres reddish yellow.

Abdomen æneous or bronze-black; second segment with a pair of large, subtriangular reddish-yellow spots, the posterior third opaque black except laterally; third segment with a similar opaque-black fascia. Pile short, longer laterally, cinereous white, black on the opaque-black fasciæ. Venter wholly shining black and with longer, pale pile.

HOLOTYPE.—Female, Yura, Peru, (Dr. E. Escomel).

### **Volucella aricia,** new species

Scutellum with eight setigerous tubercles. Related to *bradleyi* Curran but the broad sides of the face are yellow pilose on the lower third, the facial tubercle is much weaker, etc. Length, 15 mm.

FEMALE.—Head translucent reddish yellow, the occiput black and densely gray pollinose; pile black, on the sides of the face below, lower half of cheeks and the occiput, yellowish. Face perpendicular, the low tubercle about one-third as long as the face; front broad, swollen, with a median groove, the lateral depressions broad. Antennæ reddish, the third segment constricted on apical third; arista black, with long rays. Eyes with reddish-yellow pile.

Mesonotum shining black, pale yellow pilose, with whitish pile forming more or less distinct vittæ and with longer black pile intermixed. Pleura with long, soft, pale yellowish pile, and longer black hairs on the mesopleura. Scutellum translucent brownish red, black-haired, the border with finer pale hair and bearing eight setigerous tubercles and an additional pair of bristles.

Legs black; tibiæ reddish on basal third or more, black-haired.

Wings hyaline; stigmal spot blackish, the stigmal cell luteous. Squamæ yellowish with brown border and yellowish brown fringe. Halteres yellow.

Abdomen shining black, the second segment reddish with the base broadly and a very broad median vitta shining black. Pile black, short, on the first segment, base of second laterally, sides of second and the basal three sternites, cinereous white. Venter wholly shining black.

HOLOTYPE.—Female, foothills west of Mendoza, Argentina, (T. D. A. Cockerell).

**Volucella bombylans** Linné

*Musca bombylans* LINNÉ, 1792, 'Syst. Nat.,' 10th Ed., p. 591.

In 1925, Johnson (Psyche, XXXII, p. 114) dealt with the American varieties of *bombylans* recognizing three subspecies and four varieties of these. The species exhibits a large range of variation in color and many varieties have been described. Of the American forms the only one recognized by Johnson and not seen by me is *arctica* Johnson.

From the material before me it seems quite certain that *facialis* Williston and *lateralis* Johnson are both the same as variety *plumata* DeGeer, a very common European form, and I have long considered them the same. In typical *facialis* there is no yellow hair on the mesonotum or pleura, while in *plumata* the sides and usually the anterior and posterior margin of the mesonotum and at least the mesopleura bear yellow pile. Intermediate forms occur. According to a type specimen of *lateralis* before me it is identical with European specimens of *plumata*.

The variety described by Jones as *rufomaculata* is apparently restricted to the Rocky Mountain region and is readily recognized by the characters given in the key.

The dark brown antennæ of the variety *arctica* Johnson distinguish it from *evecta* Walker and *americana* Johnson.

Johnson does not recognize the typical *evecta* of Walker. I think that there can be no doubt that this is the same as *sanguinea* Williston.

The variety *americana* Johnson is a very easily recognized form and rather common in the northern states and Canada.